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Commentary: Preventing suicide through pesticide regulation

Restriction of access to highly lethal and commonly used suicide methods is one of the few proven approaches available to governments to reduce overall suicide rates.[1,2] In high-income countries, the approach has largely focused on restricting the sales of, or withdrawing, medicines that are commonly taken in fatal overdoses, restricting access to guns, and making high-risk locations (such as bridges) safer.[2] In low- and middle-income countries, where pesticides are a common means of suicide, it has focused on government actions to remove highly hazardous pesticides (HHP) from agriculture.[3]

Means restriction works because suicidal impulses are often transient, lasting only minutes or hours.[1] The easy accessibility of lethal means, such as guns or HHPs, during these periods of heightened risk may make the difference between survival and death. Making them difficult to access will often result in the use of a less lethal means (such as self-poisoning with medicines) or prevent the suicide attempt occurring altogether. Surviving a suicide attempt allows the person to return to her/his family and community and obtain the support s/he may need from mental health services. The great majority of survivors do not go on to repeat the act or to die from suicide.[4] Means restriction makes suicidal impulses survivable, whatever the surrounding situation and stresses.

Pesticide self-poisoning is a major public health problem in low- and middle-income countries, being responsible for about one in five suicides worldwide.[1] In the 1950s, due to changes in agricultural policy and the Green Revolution, as well as marketing campaigns by the agrochemical industry, households in poor and stressed rural communities became reliant on pesticides for agriculture and almost all households in rural communities stored pesticides in their homes. Using and storing pesticides that were sometimes as toxic as the nerve agent sarin was never going to be safe, and resulted in an epidemic of suicides, now likely numbering more than 14 million.[5]

However, these deaths can be prevented by banning key HHPs. This has been most effectively implemented and evaluated in Sri Lanka, where an exponential increase in suicides was reversed through bans of a few locally problematic HHPs.[6] As a result of this policy, the total suicide rate fell by more than 70% between 1995 and 2015, saving an estimated 93,000 lives, at a remarkable direct government cost of less than 50 USD per life saved.[6] Other countries have followed this approach, with many tens of thousands of lives saved to date in South Korea, Bangladesh, and elsewhere.[3]

Importantly, the bans have not resulted in reduced agricultural yields, due to careful preparation before their implementation, identification of safer alternatives, and provision of information to farmers,.[3,7] It is clear that HHPs can be banned for the benefit of health and the environment, without causing famine.

On September 02, 2019, the WHO's Mental Health department, using standard cost-effectiveness methodology, concluded that pesticide regulation is highly cost-effective in low and low-middle income countries, costing less than 10,000 dollars per million population to implement, while gaining 100-500 healthy life years, at a cost of <100 dollars per healthy life year gained.[8] They highlighted this approach as one of the - if not the - most cost-effective interventions in mental health so far identified.

For many years, global policy focused on advising farmers to store their pesticide securely, aiming to reduce access at times of stress by providing lockable storage.[9] This approach was strongly supported by the pesticide industry as it was unlikely to affect sales.[10] However, a randomised controlled trial including 223,000 people in 53,000 households demonstrated that improved household storage of

pesticides is ineffective, with noticeably no effect during the first year when such an active intervention might be expected to most likely work.[11] This finding may have implications for other attempts to reduce access by improving storage at home, most obviously of guns.[1] Community based approaches are likely to be similarly ineffective for pesticide suicides since pilot studies in China have shown that only 4-13% of households still used such storage systems effectively after 3 years.[9] Continuing to research such approaches is a distraction from population based prevention.[12]

Means restriction through pesticide regulation is highly effective at preventing suicide despite the complex factors that cause a person to attempt suicide. In settings where pesticide self-poisoning is a commonly used method of suicide, suicide rates can be brought down rapidly and affordably without the expense of psychosocial and economic interventions. We believe that Ministries of Agriculture and Health in countries where pesticide suicides occur should work together to implement this cost-effective approach to suicide prevention.[13]

Prof Michael Eddleston, Centre for Pesticide Suicide Prevention, University of Edinburgh, UK
Prof David Gunnell, Population Health Sciences, Bristol Medical School, University of Bristol, UK

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